request in a nonblocking way on the condition that the connection request is compliant to certain constraints, the method for each of the upturned expanders includes: (a) configuring a switch defined by a set of connection states and having an array of N input ports with N distinct input addresses and an array of N output ports with N distinct output addresses wherein the m incoming signals arrive at m input ports determining m active input addresses and are destined for a total of n, $m \leq n \leq N$, distinct output ports determining n active output addresses, and wherein said constraints on the connection request are that: (1) the m active input addresses are consecutive upon a rotation of the ordering of the N input addresses, and (2) for any two active input addresses i and j and any two active output addresses p and q such that i is being connected to p and j is being connected to q, if i precedes j with respect to the rotated ordering, then $q < p$; and (b) routing the incoming signals from said m input ports to said n distinct output ports by activating one of the connection states such that the activated one of the connection states accommodates the connection request subject to said constraints on the connection request.

#1 cont

In accordance with a broad system aspect of the present invention, a class of N×N upturned expanders each serving a connection request to route m incoming signals, $m \leq N$, and for enabling the service of any connection request in a nonblocking way on the condition that the connection request is compliant to certain constraints, each of the upturned expanders includes: (a) a switch defined by a set of connection states and having an array of N input ports with N distinct input addresses and an array of N output ports with N distinct output addresses wherein the m incoming signals arrive at m input

ports determining m active input addresses and are destined for a total of n, $m \leq n \leq N$, distinct output ports determining n active output addresses, and wherein said constraints on the connection request are that: (1) the m active input addresses are consecutive upon a rotation of the ordering of the N input addresses, and (2) for any two active input addresses i and j and any two active output addresses p and q such that i is being connected to p and j is being connected to q, if i precedes j with respect to the rotated ordering, then $q < p$; and (b) control circuitry, coupled to the switch, for routing the incoming signals from said m input ports to said n distinct output ports by activating one of the connection states such that the activated one of the connection states accommodates the connection request subject to said constraints on the connection request.

A1 Cont.

Please replace lines 1-3 on page 13 as follows: --

FIG. 21B depicts a (1 2 3) permutation on an 8×8 exchange;

A2

FIG. 21C depicts a (3 1) permutation on an 8×8 exchange;

FIG. 21D depicts a combined (1 4)(2 3) permutation on an 8×8 exchange;--.

Page 104, replace line 13 as follows: --$k \leq N$, from k inputs (which are not necessarily distinct) to k distinct outputs subject to: there exists a rotation on the ordering of--.

INSERT A3

Page 104, replace line 15 as follows: --(a) the k active input addresses (which are not necessarily distinct) are consecutive after the rotation; and--.

INSERT A4